

REMARKS

The final Office Action of **December 19, 2001**, has been received and its contents carefully noted. Claims 1-6, 9, 10, 15, 16, 22-27, 40 and 46-74 were pending in the present application prior to the aforementioned amendment. By the above Amendment, claims 59 and 67-74 are amended. Applicant respectfully submits that no issue of new matter has been set forth by this Amendment. Accordingly, claims 1-6, 9-10, 15-16, 22-27, 40 and 46-74 remain pending in the subject application, and are believed to be in condition for allowance at least for the reasons advanced hereinbelow.

A. Objection to the Specification

Initially, the Office Action objects to the Title of Invention as non-descriptive. By the above Amendment, the Title of Invention has been replaced with one which is indicative of the invention to which the claims are directed. In particular, the new Title of Invention recites --SEMICONDUCTOR DEVICE HAVING A CONTACT HOLE EMBEDDED WITH A CONDUCTIVE LAYER--. In view of this change, reconsideration and withdrawal of the objection is earnestly solicited.

B. 35 U.S.C. §112, 2nd Paragraph Rejection

The Examiner rejects claims 68-74 under 35 U.S.C. §112, 2nd paragraph as indefinite for failing to particularly point out and distinctly describe the subject matter which Applicant regards as the invention. In response thereto, claims 68-74 are amended so that the recitation "a metal" recites "an organic material," or "an inorganic material," respectively. Inasmuch as the rejected claims now define subject matter that would be considered definite by one of ordinary skill in the art, consideration of the amended claims and withdrawal of the rejection is respectfully solicited.

C. 35 U.S.C. §112, 1st Paragraph Rejection

The Examiner rejects claims 68-74 under 35 U.S.C. §112, 1st paragraph as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the invention was filed, had possession of the claimed invention. In particular, the Examiner finds that the recitation "said interlayer insulating film is made from a metal" is not supported by the disclosure. In response thereto, the rejected claims are amended so as to recite that the interlayer insulating film is made from either an organic or inorganic material, which is adequately supported by the disclosure. Accordingly, reconsideration and withdrawal of the rejection is earnestly solicited.

D. 35 U.S.C. §103 Rejections

The Examiner rejects claims 1, 47, 51, 55, 59, 63 and 67 under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,081,305 to *Sato et al.* (Hereinafter "*Sato*") in view of U.S. Patent No. 5,706,064 to *Fukunaga*, claims 2, 22-27, 40, 48, 52, 56, 60 and 64 under 35 U.S.C. 103(a) as unpatentable over *Sato* in view of *Fukunaga* and U.S. Patent No. 5,990,542 to *Yamazaki*, claims 3, 2-27, 40, 49, 53, 57, 61 and 65 under 35 U.S.C. 103(a) as unpatentable over *Sato* in view of *Fukunaga* and U.S. Patent No. 6,097,453 to *Okita*, claims 4, 50, 54, 58, 62 and 66 under 35 U.S.C. 103(a) as unpatentable over *Sato* in view of *Okita*, *Yamazaki* and *Fukunaga*, claims 5, 16, 22-27, 40 and 46 under 35 U.S.C. 103(a) as unpatentable over *Sato* in view of *Fukunaga*, claims 6 and 15 under 35 U.S.C. 103(a) as unpatentable over *Sato* in view of U.S. Patent No. 5,948,705 to *Jun*, and claims 9 and 10 under 35 U.S.C. 103(a) as unpatentable over *Yamazaki* and *Jun* in view of *Fukunaga*. Applicant respectfully traverses the grounds for rejection in contending that the claimed invention defines subject matter which is clearly patentably distinct over the prior art of record.

The claimed invention is directed generally to a semiconductor device including, *inter alia*, an interlayer insulating film having at least one contact hole, an embedded conductive layer provided to fill the contact hole, and a reflective pixel electrode (i.e., a second conductive layer) formed on the interlayer insulating film, and thus, also the at least one contact hole.

1. The *Sato* Patent Fails to Teach the Claimed Invention

Initially, it is contended that the *Sato* patent, either alone or in combination with the *Fukunaga*, *Yamazaki*, *Jun* and *Okita* patents, fails to expressly teach or remotely suggest all of the limitations presently set forth in the claimed invention necessary to support a finding of *prima facie* obviousness under §103. More particularly, Applicant disagrees with the Examiner's characterization of what is disclosed in *Sato* and how this disclosure reads on what is claimed in the present invention. For instance, the Examiner finds that the *Sato* patent allegedly discloses a semiconductor device comprising an embedded conductive layer 171 provided to fill a contact hole of an interlayer insulating film 170, and a reflective pixel electrode 181 formed on the interlayer insulating film 170. However, Applicant feels that the claimed invention is patentably distinct from *Sato* since it teaches separate formation and presence in the resulting device of the embedded conductive layer and the reflective pixel electrode, i.e., the second conductive layer. Inasmuch as the *Sato* patent fails to expressly teach or inherently suggests the separate formation and presence of an embedded conductive layer and a second conductive layer, its proposed combination with any of the *Yamazaki*, *Okita*, *Jun* and *Fukunaga* patents still fails to render every claimed feature obvious since they too fail to disclose such a feature.

2. The Proposed Combination of *Sato* and *Fukunaga* is Improper

Notwithstanding the above-noted argument with respect to *Sato*, it is further

contended that the *Fukunaga* patent fails to modify the *Sato* patent in a manner sufficient to render the claimed invention obvious. For instance, *Fukunaga* discloses filling a contact hole with a conductive material in a liquid crystal device and conductive materials.

However, the claimed invention is patentably distinguishable from *Fukunaga* in that the semiconductor device in accordance with the claimed invention requires a reflective pixel electrode, while *Fukunaga* merely teaches a transparent pixel electrode. In a case of a transmission type display using a transparent electrode, the portions where transistors and metal wiring exist serve to block light so that a portion over these portions generally do not function as a display. Hence, a flatness of the pixel electrode over the contact hole is not important for enhancing display quality. On the contrary, in the case of using a reflective pixel electrode, because light does not require transmission through a TFT substrate, substantially 100% of the area of the pixel electrode functions as a display by nature. Therefore, it is more important to improve the flatness of the pixel electrode over the contact hole in a reflective type display than in a transmission type display. In other words, the effect of the claimed invention is more significant in the case of a reflective type pixel electrode than in the case of the transmission type pixel electrode disclosed in *Fukunaga*. It is contended that such a distinguishing feature is probative of the non-obviousness of the claimed invention since there is no suggestion to combine the teachings of *Fukunaga* with *Sato* in view of the above arguments. Moreover, the addition of *Yamazaki*, *Jun* or *Okita* do nothing to overcome the deficiencies of *Fukunaga* and *Sato*. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

3. The Proposed Combination of *Jun*, *Fukunaga*, *Yamazaki* and *Sato* is Improper

Regarding the rejection of claims 6, 9, 10 and 15, it is further contended that the proposed combination of *Jun* with *Fukunaga*, *Yamazaki* and *Sato* is improper in that no motivation exists for their combination. For instance, the Examiner finds that it would be

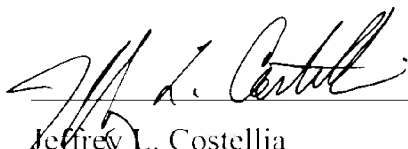
prima facie obvious to one of ordinary skill to combine the respective teachings of **Jun** with **Fukunaga**, **Yamazaki** and **Sato** because it discloses the formation of a metal electrode on an embedded conductive layer.

However, although **Jun** appears to teach the formation of a conductive material pattern on an embedded conductive layer, it never teaches or remotely suggest: (1) the formation of a pixel electrode on the embedded material, and (2) that the conductive material pattern functions as an electrode. Accordingly, there is nothing within the express or implicit teachings of **Jun** that would motivate one of ordinary skill to combine it with the teachings of **Yamazaki**. Such a lack of motivation is indicia of the non-obviousness of Applicant's invention. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

Conclusion

Accordingly, Applicant respectfully submits that the pending claims are in proper condition for allowance and consideration and withdrawal of the pending rejections are requested. If the Examiner believes further discussions with Applicant's representative would be beneficial in this case, he is invited to contact the undersigned.

Respectfully submitted,



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MARKED UP VERSION OF AMENDED CLAIMS

59. (Amended) A device according to claim 1, wherein said medium is an [organic] inorganic material.

67. (Amended) A device according to claim 1, wherein said [medium is an inorganic material] interlayer insulating film comprises an organic material.

68. (Amended) A device according to claim [2] 1, wherein said interlayer insulating film is made from [a metal] an inorganic material.

69. (Amended) A device according to claim 3, wherein said interlayer insulating film is made from [a metal] an organic material.

70. (Amended) A device according to claim [4] 3, wherein said interlayer insulating film is made from [a metal] an inorganic material.

71. (Amended) A device according to claim 47, wherein said interlayer insulating film is made from [a metal] an inorganic material.

72. (Amended) A device according to claim [48] 47, wherein said interlayer insulating film is made from [a metal] an organic material.

73. (Amended) A device according to claim 49, wherein said interlayer insulating film is made from [a metal] an inorganic material.

74. (Amended) A device according to claim 49, wherein said interlayer insulating

film is made from [a metal] an organic material.